Training Needs of Agricultural Scientists in Electronic Information Environment : A Study

Jivesh Bansal
Deputy Librarian,
Panjab University Library, Chandigarh-160014.
E-mail: jivesh@pu.ac.in

Abstract :

This article is based on an extensive study that investigated the information seeking behaviour of agricultural scientists at the ICAR establishments of North-Western India in the electronic environment. The characteristics of electronic environment have an advantage over print environment, and have paved way for effecting changes in the traditional formats of information, emergence of new formats, as well as formulation of new models for dissemination of information. But this machine-dependent environment also has certain challenges such as internet speed, lack of training, high cost, etc. Those agricultural scientists who have used print sources during the major part of their research and professional career have to face difficulties even in respect of the basic aspects of this new information environment due to their being long accustomed to the old models of information and their apathetic attitude to the new environment. Imparting necessary training regarding information skills goes a long way in creating awareness and proper utilization of the products and services of the new information environment. This paper highlights the difficulties faced by agricultural scientists in using electronic information sources and services to seek information which they require to meet their varied information needs. Further, the paper highlights the training aspects of agricultural scientists such as training needs, duration and the areas where they feel it necessary to upgrade their skills through training programmes.

Keywords: Training needs; Agricultural scientists; Electronic environment; Indian Council of Agricultural Research; E-resources; Information needs.

1. Introduction

The electronic environment has revolutionised information systems and services worldwide. The existing formats and services are changing being converted into the electronic form and new formats and services of the new environment are coming into being, causing a paradigm shift from print to electronic environment. The term 'electronic resources' (e-resources) is regarded as synonymous with internet-based-information resources these days, although CD-ROM/DVD-ROM products are offline form of e-resources. Libraries associated with agricultural institutes in India are creating infrastructure and providing access to these new products of changing information environment. Agricultural scientists have, no doubt, general awareness of e-resources and young scientists, are sufficiently acquainted with new collections. This machine-dependent environment in particular may pose some initial difficulties such as cost, infrastructure, searching abilities, etc. yet these are not insurmountable. As the e-resources have accessibility through networks, rather than ownership, browsing, searching and retrieving desired results from these new products also constitute another challenge regarding their optimal and critical use. Agricultural scientists may also lack proper training in retrieving targeted results from the deeper web. The term 'training needs' implies the gap between what one knows and what one ought to know in order to perform a particular task.

2. Research Methodology

This study was carried out using structured interview schedule at fourteen ICAR (Indian Council of Agricultural Research) establishments (Institutes / National Research Centres / Bureaus / Directorates / Project Directorates) of five states i.e. Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttarakhand & one Union Territory i.e. Chandigarh.

The state of *Haryana* has six establishments [National Dairy Research Institute, Central Soil Salinity Research Institute, Karnal (CSSRI), Directorate of Wheat Research, Karnal (DWR), National Bureau of Animal Genetic Resources, Karnal (NBAGR), Central Institute for Research on Buffaloes, Hisar (CIRB) and National Research Centre on Equines, Hisar (NRCE)]; *Himachal Pradesh* has two (Central Potato Research Institute, Shimla (CPRI) and Directorate of Mushroom Research, Solan (DMR)]; *Jammu & Kashmir,* one [Central Institute of Temperate Horticulture, Srinagar (CITH)]; *Punjab,* one [Central Institute of Post-Harvest Engineering and Technology, Ludhiana (CIPHET)]; *Uttarkhand,* four [Vivekanand Parvatiya Krishi Anusandhan Sansthan, Almora (VPKAS), Central Soil & Water Conservation Research & Training Institute, Dehradun (CSWCRTI), Directorate of Coldwater Fisheries Research, Bhimtal (DCFR) and Project Directorate on Foot & Mouth Disease, Mukteswar (PDFMD)]; but *Chandigarh* has no ICAR establishment.

Any regional stations of the selected institutes or of other ICAR establishments in this region were not included in the study. The 'Stratified Random Sampling Technique' had been used and three hundred and fifty four scientists were interviewed from among the three strata of scientists in these establishments [Seventy percent from each stratum i.e. Scientists, Senior Scientists (Sr. Scientists) and Principal Scientists (Pr. Scientists)].

3. Literature Review

Malhotra (1990) suggested that it was imperative to impart training to the user for the better use of the library on the basis of her study on the post graduate students of Chaudhary Charan Singh Haryana Agricultural University (CCSHAU) and Punjab Agricultural University (PAU). Curtis, Weller and Hurd (1997) observed that health science faculty did not take advantage of the electronic training sessions organised by the librarians in relationship to the use of new products and services. Kiplang'at and Ocholla (2005) found that majority of agricultural researchers and extension workers in Kenya were deficient in computer & Internet skills required for the use of various new information products & services, but they were interested in receiving training on all aspects of information and communication technologies (ICTs). In a study conducted on agricultural science students concerning the use of print and electronic resources in three Nigerian universities, (Agboola , 2010), it was suggested that yearly orientation and library use programmes be introduced in the general undergraduate curriculum to train students regarding the use of library resources. A study of Sambalpur University, Sethi and Panda (2012) brought out the fact that lack of training was one of the key constraints in the use of e-resources by life scientists of Sambalpur University.

4. Data Analysis

This study is a part of a broader study which was carried out to examine the information-seeking behaviour of the agricultural scientists at the ICAR establishments of North-Western India in

the electronic environment. The study revealed that Internet was the most-used information source, and on an average an agricultural scientist spent seven to eight hours a week on this source for various information activities. Agricultural scientists have general awareness about different kinds of e-resources. There is a significant variation in so far as awareness of e-resources among three positions of agricultural scientists i.e. Scientists, Sr. Scientists and Pr. Scientists is concerned. Young scientists are more aware of different kinds of e-resources than their senior counterparts. Agricultural scientists make a frequent use of e-journals and online databases, but the use of new digital products such as institutional repositories, subject gateways, blogs, wikis, etc. is not so common. The formidable problem faced by agricultural scientists was that of the slow speed of internet connection. The other two major problems faced by agricultural scientists were: lack of proper training in the use of e-resources and lack of the awareness of search strategy. The views of agricultural scientists on the training of e-resources are discussed in detail. (Bansal, 2012)

4.1 Training in the Use of E-resources

The training of users is an indispensable part of a good information system. The changing-information scenario has made it highly essential to train them so that they may be able to best utilise the products and services of the new environment. In the present study, agricultural scientists were asked whether they had undergone any training programme/s in the use of e-resources. Their responses have been presented in the following sections.

Table 1 : Training in Use of E-Resources

Sr. No.	Category of Scientists	Yes No. (%age)	No No. (%age)	Total No. (%age)
1	Scientists	24 (25.81)	69 (74.19)	93 (100.00)
2	Sr. Scientists	32 (27.12)	86 (72.88)	118 (100.00)
3	Pr. Scientists	30 (20.98)	113 (79.02)	143 (100.00)
4	Total	86 (24.29)	268 (75.71)	354 (100.00)

Table 1 reveals that only a small number of respondents i.e. nearly every one out of four (24.29 percent) had undergone training regarding the use of e-resources, and a majority of them (75.71 percent) had not obtained any training concerning the use of e-resources. This shows that a large majority of agricultural scientists have not yet been trained through formal training programmes in ICAR establishments.

4.2 Usefulness of Training

The agricultural scientists who had undergone training were further asked about the usefulness of the said training in handling electronic information. Table 2 reveals that 89.53 percent of those agricultural scientists who had undergone training, found it useful in generating more

awareness about e-resources. The 74.42 percent respondents were able to sharpen their skills in regard to the use of search engines, while 65.12 percent started making efficient use of bibliographic databases after undergoing training on e-resources. The 59.30 percent agricultural scientists were benefited in terms of the better use of the internet-based library services. The training was helpful to 53.49 percent respondents in having better overall understanding of the electronic information services of the libraries. This shows that the agricultural scientists who underwent training were significantly benefited in understanding of new information environment.

Table 2 : Usefulness of Training

Sr. No.	Area of Usefulness	Category of Scientists						Total (N=86)	
		Scientists Sr. (N=24)		Scientists (N=32)		Pr. Scientists (N=30)			
		Yes	No	Yes	No	Yes	No	Yes	No
1	Awareness of e-resources	22 (25.58)	2 (2.33)	30 (34.88)	2 (2.33)	25 (29.07)	5 (5.81)	77 (89.53)	9 (10.47)
2	Improved use of search engines	21 (24.42)	3 (3.49)	27 (31.40)	5 (5.81)	16 (18.60)	14 (16.28)	64 (74.42)	22 (25.58)
3	Efficient use of bibliographic databases	20 (23.26)	4 (4.65)	23 (26.74)	9 (10.46)	131 (15.12)	7 (19.77)	56 (65.12)	30 (34.88)
4	Use of Internet based library services	17 (19.77)	7 (8.14)	19 (22.09)	13 (15.12)	15 (17.44)	15 (17.44)	51 (59.30)	35 (40.70)
5	Use of electronic information services of the libraries.	13 (15.12)	11 (12.79)	19 (22.09)	13 (15.12)	14 (16.28)	16 (18.60)	46 (53.49)	40 (46.51)

4.3 Need for Training

The respondents who had not undergone any training were further asked to state whether they felt the need for training on e-resources, and what its duration and contents ought to be. Table 3 presents the responses of the agricultural scientists in regard to their need for training. A majority of 69.03 percent of the agricultural scientists felt the need for such a program to upgrade their skills on various aspects of electronic environment. Category wise, 72.46 percent, 63.95 percent and 70.80 percent of Scientists, Sr. Scientists and Pr. Scientists respectively felt the need for being given training on e-resources.

Table 3 : Need for Training

Sr. No.	Category of Scientists	No. of Scientists	Percentage
1	Scientists N=69	50	72.46
2	Sr. Scientists N=86	55	63.95
3	Pr. Scientists N=113	80	70.80
4	Total N=268	185	69.03

4.4 Duration of Training

Table 4 clearly shows that a large majority of 73.51 percent responded on the issue of duration. The table further explains the views of the agricultural scientists on the period of training. A majority of 63.24 percent of the agricultural scientists expressed the view that approximately one- week training programme to upgrade their skills in electronic environment was sufficient. About twenty percent (19.85 percent) of the scientists opined that the training programme should be of the duration of two weeks; 6.62 percent and 10.29 percent maintained that its duration should be of three weeks and even more than that of three weeks, respectively. The agricultural scientists who wanted to attend three-week or more than three-week training sought a comprehensive training programme in the form of a refresher course or a summer school to learn about electronic environment/ e-resources in detail. This shows that majority of the agricultural scientists are interested in short-term training programmes on electronic information products and services.

Table 4 : Duration of Training

Sr. No.	Category of Scientists	Training Period				Total No. (%age)
		Up to One WeekNo. (%age)	Two Weeks No. (%age)	Three Weeks No. (%age)	More than three Weeks No. (%age)	
1	ScientistsN=38	21 (55.26)	7 (18.42)	4 (10.53)	6 (15.79)	38 (100.00)
2	Sr. ScientistsN=38	23 (60.53)	9 (23.68)	4 (10.53)	2 (5.26)	38 (100.00)
3	Pr. ScientistsN=60	42 (70.00)	11 (18.33)	1 (1.67)	6 (10.00)	60 (100.00)
4	Total N=136 (73.51%)	86 (63.24)	27 (19.85)	9 (6.62)	14 (10.29)	136 (100.00)

4.5 Areas of Training

Agricultural scientists also mentioned several specialized facets for training in e-resources. A small number of agricultural scientists who had already undergone training in e-resources also sought training in advance areas of electronic information environment. A few agricultural scientists also suggested multiple facets for their training. Thus 208 responses were received for training on electronic information environment.

A majority of nearly sixty percent (58.65 percent) respondents were in favour of general training programme/s on e-resources and services in agricultural sciences. The training could include awareness/use aspects of e-resources, e-library services, subject guides, ICTs tools and techniques, etc. The 15.87 percent respondents were interested in 'Advanced search mechanisms' i.e. various search engines, search strategies in the use of e-resources, whereas 7.21 percent of them felt the need for regular training for updating skills of e-resources. Fourteen respondents (6.73 percent) wanted to undergo training on webpage creation, blog creation and other Web 2.0 tools. Emphasis

on training of CeRA (Consortium for e-Resources in Agriculture) resources was laid in eight responses (3.85 percent). Six respondents (2.88 percent) wanted exhaustive training programme on e-learning, in the form of refresher courses/summer schools, etc. A few agricultural scientists (2.40 percent) showed interest in getting training on the basic aspects of computers and internet usage. In two different categories i.e. Open access material and Statistical analysis of data/ Statistical softwares, two respondents (0.96 percent) in each came forth for training. Only one agricultural scientist evinced interest in training on photography softwares for better research photographs. The principal scientists were more interested in receiving training concerning basic aspects of internet usage and electronic library services. This study clearly establishes and substantiates that agricultural scientists in ICAR establishments are keenly interested in updating their skills for efficient use of e-resources.

Table 5 : Areas of Training

Sr. No.	Areas of Training	Designation			Total No. (%age)
		Scientists No. (%age)	Sr. Scientists No. (%age)	Pr. Scientists No. (%age)	
1	Electronic Sources and Services	27 (50.00)	37 (59.68)	58 (63.04)	122 (58.65)
2	Advanced Search Mechanisms (Search Strategies, Search Engines, etc.)	11 (20.37)	7 (11.29)	15 (16.30)	33 (15.87)
3	Regular Training for Updating Skills in E-Resources	5 (9.26)	6 (9.68)	4 (4.35)	15 (7.21)
4	Web Designing/Web 2.0 Tools	4 (7.41)	6 (9.68)	4 (4.35)	14 (6.73)
5	Basic Aspects/ Internet Usage	1 (1.85)	1 (1.61)	3 (3.26)	5 (2.40)
6	Exhaustive Training on E-learning	1 (1.85)	2 (3.23)	3 (3.26)	6 (2.88)
7	JCCC/CeRA Resources	2 (3.70)	3 (4.84)	3 (3.26)	8 (3.85)
8	Open Access Material	1 (1.85)	0 (0.00)	1 (1.09)	2 (0.96)
9	Statistical Analysis of Data/ Statistical Softwares	2 (3.70)	0 (0.00)	0 (0.00)	2 (0.96)
10	Photography Softwares	0 (0.00)	0 (0.00)	1 (1.09)	1 (0.48)
11	Total	54 (100)	62 (100)	92 (100)	208 (100)

5. Conclusion

The agricultural scientists in ICAR establishments are using various e-resources through interpersonal help, self training, etc. But they understand the benefits of undergoing training in the new information environment for its optimal and critical use. They are predominantly interested in short-term training courses on e-resources. They have also expressed the need for training concerning search mechanisms, Web 2.0 tools, consortia resources, ICT tools & techniques, etc. The agricultural scientists who are well versed in the use of e-resources are willing to take training with regard to advanced topics of electronic information environment for updating their skills. In general, it can be concluded that electronic sources are of paramount importance to agricultural scientists for their information needs, and, therefore it is imperative that adequate training be imparted to enable them to develop the necessary skills to use these sources effectively. The ICAR should develop strong information systems in line with the changed information environment to provide conducive research environment to the agricultural scientists of the country.

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